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Indian Standard
SPECIFICATION FOR
MAGNESITE NOZZLES

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SPECIFICATION FOR MAGNESITE NOZZLES

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Indian Standard

SPECIFICATION FOR MAGNESITE NOZZLES

0. F O R E W O R D

0.1 This Indian Standard was adopted by the Indian Standards Institution on 27 October 1978, after the draft finalized by the Refractories Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 A perfect nozzle permits teeming of entire cast of metal at a constant rate without splashing on the sides of ingot mould and without contaminating the metal. The nozzle should also maintain a perfect seating for the stopper head so that no dribbling occurs while the ladle is being removed from one mould to the other.

0.3 Data is being collected to finalize the requirements for apparent porosity and surface defects of magnesite nozzles.

0.4 Requirements for fireclay nozzles are covered in IS : 4564-1968*.

0.5 In the preparation of this standard, assistance has been derived from GOST 5500-1974 'High duty and super duty refractories for steel pouring' issued by Gosudarstvennyj Komitet Standartov, Mer i Izmeritel'nyh Priborov SSSR (USSR).

0.6 This standard keeps in view the manufacturing and trade practices followed in the country in this field.

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements for magnesite nozzles for use in ladles in foundries and steel plants.

*Specification for fireclay nozzles.

†Rules for rounding off numerical values (*revised*).

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of magnesite nozzles shall be as laid down in IS : 1387-1967*.

2.2 The nozzle shall be compact, of homogeneous texture and free from cracks, voids and other flaws. They shall be burnt evenly throughout, shall have no soft corners and shall have sufficient mechanical strength. The contour of the place where the stopper head will sit, shall be checked by a template to find out whether the proper contour according to the drawing has been maintained.

3. TERMINOLOGY

3.1 For the purpose of this standard the definition given in IS : 4041-1967† and the following shall apply.

3.1.1 Conicity — It is the ratio of the difference between the upper and lower diameter of cylindrical surface, to the height of said surface.

4. SIZES AND TOLERANCES

4.1 The shapes and sizes of the nozzles shall be as agreed to between the manufacturer and the purchaser.

4.2 Tolerances — The following tolerances on the sizes of the nozzle shall apply:

- a) On diameters of nozzles:
 - Up to 50 mm ± 1 mm
 - Over 50 and up to 100 mm ± 2 mm
 - Over 100 mm
 - For products manufactured by the dry press process ± 1 percent or 2 mm whichever is greater
 - For products manufactured by the plastic method ± 2 percent
- b) On height of seat for insert ± 2 mm
- c) On height, length and width of nozzle ± 3 percent
- d) Conicity in the height of cylindrical and prismatic surfaces of products, 0.013
Max

*General requirements for the supply of metallurgical materials (*first revision*).

†Glossary of terms relating to refractory materials.

5. CHEMICAL COMPOSITION

5.1 The material shall contain a minimum of 85 percent MgO.

NOTE — Till a suitable Indian Standard is published for the method of chemical analysis of MgO, the determination of MgO shall be as agreed to between the purchaser and the manufacturer.

6. BULK DENSITY

6.1 When tested in accordance with IS:1528 (Part XII)-1974*, the minimum bulk density of the material shall be not less than 2.4 g/ml and not more than 2.85 g/ml. The exact minimum value shall be mutually agreed between the manufacturer and the user depending upon usage.

7. SAMPLING AND CRITERIA FOR CONFORMITY

7.1 Representative samples shall be drawn according to the scheme of sampling given in IS:1528 (Part VII)-1974† for carrying out tests specified in this standard and criteria for judging the conformity of the product to the specification shall be as laid down in the above specification.

8. MARKING

8.1 Each nozzle shall be clearly marked with the manufacturer's name or trade-mark.

8.1.1 The nozzle may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

*Methods for sampling and physical tests for refractory materials: Part XII Determination of bulk density (*first revision*).

†Methods for sampling and physical tests for refractory materials: Part VII Methods of sampling and criteria for conformity (*first revision*).

INDIAN STANDARDS

ON

REFRACTORIES

IS:

- 6-1967 Moderate heat duty fireclay refractories, Group A (*third revision*)
7-1967 Moderate heat duty fireclay refractories, Group B (*third revision*)
8-1967 High heat duty fireclay refractories (*third revision*)
195-1963 Fireclay mortar for laying fireclay refractory bricks (*second revision*)
483-1972 Fireclay refractories for oil-fired boiler furnaces of naval ships (*first revision*)
484-1958 Silica refractories for general purposes (*revised*)
1292-1958 Mortar for laying silica bricks
1335-1959 Methods for the direct determination of alumina in refractory materials (*tentative*)
1522-1967 Fireclay glass tank blocks (*first revision*)
1523-1972 Bottom-pouring refractories for steel plants (*first revision*)
1524-1968 Refractory sleeves (*first revision*)
1525-1968 Ladle refractories for steel plants (*first revision*)
1526-1960 Sizes and shapes for firebricks (230 mm series)
1527-1972 Methods for chemical analysis of high silica refractory materials (*first revision*)
1528 (Part I)-1974 Methods of sampling and physical tests for refractory materials:
Part I Determination of pyrometric cone equivalents (PCE) or softening point (*first revision*)
1528 (Part II)-1974 Determination of refractoriness under load (*first revision*)
1528 (Part III)-1974 Determination of spalling resistance (*first revision*)
1528 (Part IV)-1974 Determination of cold crushing strength (*first revision*)
1528 (Part V)-1974 Determination of modulus of rupture (*first revision*)
1528 (Part VI)-1974 Determination of permanent change after reheating (*first revision*)
1528 (Part VII)-1974 Methods of sampling and criteria for conformity (*first revision*)
1528 (Part VIII)-1974 Determination of apparent porosity (*first revision*)
1528 (Part IX)-1974 Determination of true specific gravity and true density (*first revision*)
1528 (Part X)-1974 Determination of sizes of refractory bricks (*first revision*)
1528 (Part XI)-1974 Determination of warpage (*first revision*)
1528 (Part XII)-1974 Determination of bulk density (*first revision*)
1528 (Part XIII)-1974 Determination of resistance to disintegration effect of carbon monoxide (*first revision*)
1528 (Part XIV)-1974 Sieve analysis (*first revision*)
1529-1971 Blast furnace refractories for steel plants (*first revision*)
1748-1961 Sizes of graphite crucibles
1749-1972 Magnesite refractories (*first revision*)
1750-1961 Dead-burned pea magnesite
1751-1968 Fireclay cupola refractories (*first revision*)
2042-1972 Insulating bricks (*first revision*)
2043-1963 Siliceous fireclay refractories
2044-1962 Sillimanite refractories for glass melting tank furnaces
2045-1962 Natural sillimanite blocks for glass melting tank furnaces
3304-1965 Burnt magnesite-chrome refractories for general purposes
3305-1965 Burnt chrome-magnesite refractories for general purposes
4041-1967 Glossary of terms relating to refractory materials
4564-1968 Fireclay nozzles
4565-1968 Fireclay stoppers
4801-1968 Chemically-bonded magnesite-chrome refractories for roof lining
4812-1972 Silica refractories for coke oven (*first revision*)
4813-1968 Chemically-bonded chrome-magnesite refractories for general purposes
4814-1968 Chemically-bonded magnesite-chrome refractories for general purposes
5495-1969 Sizes and shapes for firebricks (300 mm and higher series)
6727-1972 Fireclay checker-bricks for open-hearth furnace
6728-1972 Recuperator tubes, tiles and collars for soaking pits in steel plants
7199-1974 Blast furnace stove refractories